

Pat. Appln. Nr 09/872,990

Docket 437-01US

Claims,

Proposed amendments, 04 May 2004

Claims amended: 1,12,29,30

Claims cancelled: 2-10,13,20-28

New claims added: 31,32

Preferred order of claims: 1,11,12,14-19,29,31,30,32

- 1 (currently amended). A method for reducing sludge viscosity of a sewage sludge having a solids concentration of at least ten percent by weight, being sewage sludge that, prior to use of the method, is so viscous as to be non-pumpable, the method comprising [the steps of]:
- (a) increasing the pH of the sludge to the range of 9.5 to [12.5] 11.5;
 - (b) ~~[selecting at least one step from~~
 - ~~(i) maintaining the sludge at the pH of (a) and at a temperature of 10°C to 37°C for a period of at least one day; [and~~
 - ~~(ii) adding one or more inorganic or organic chemicals to the sludge, such chemicals contributing to viscosity reduction;]~~
 - (c) incubating the sludge by maintaining the resultant sludge at a temperature in the range of 40°C to 100°C for a period of time of at least one hour;
 - (d) subjecting the sludge to physical shearing or disintegration, of such vigour and duration as to transform the sludge from being non-pumpable to being pumpable;
 - (e) subsequently discharging the sludge;
- and carrying out the step (d) no later than simultaneously with the step (c).
- 2-10 (cancelled).
- 11 (original). The method of claim 1 in which the solids concentration of at least ten percent is obtained using a screw press, belt press or a centrifuge.
- 12 (currently amended). The method of claim 1 in which the sludge pH is adjusted to [10.5-11.5.] at least 10.5.
- 13 (cancelled).
- 14 (original). The method of claim 1 in which the sludge is held in step (c) at a temperature and for a time sufficient to eliminate microbial pathogens.
- 15 (original). The method of claim 1 in which the pH is increased

using a mono or divalent hydroxide.

- 16 (original). The method of claim 15 in which the pH is increased using lime.
- 17 (original). The method of claim 1 in which some or all of the shearing of step (d) is effected by the action of pumps.
- 18 (original). The method of claim 1 in which at least one of the treatments occurs in a batch procedure.
- 19 (original). The method of claim 1 in which at least one of the treatments occurs in a continuous procedure.
- 20-28 (cancelled)
- 29 (currently amended). [~~Apparatus~~] Method of claim 1, wherein the shearing is done vigorously enough to ensure substantial physical breakdown of cells, thereby releasing water from the cells.
- 30 (currently amended). [~~Apparatus~~] Method of claim 1, including carrying out the step (d) sequentially after the step (a).
- 31 (new). Method of claim 29, wherein the shearing is done using a rotating toothed disc or impeller, having a tip speed of 1000 to 10,000 feet/minute.
- 32 (new). Method of claim 1, wherein the sludge having a solids concentration of at least ten percent by weight is sludge that has been de-watered from a lower solids concentration, and wherein the step of de-watering includes passing the sludge through at least one of: a screw press; a belt press; a centrifuge; a filtration unit.